

Collaborative Initiative for Plant Breeding Education

Grant No. 2006-03495
\$330,000

Collaborative Project between:

- **University of Puerto Rico, Mayagüez**
- **North Dakota State University, Fargo**



Project Directors

- **Dr. Linda Wessel Beaver, UPR**
- **Dr. Feiko Ferwerda, UPR**
- **Dr. Richard Horsley, NDSU**
- **Dr. Marcelo Carena, NDSU**

Background

- **UPR-Mayaguez has M.S. programs in Agricultural Sciences; no Ph.D. program**
- **UPR and NDSU have carried out collaborative research projects in plant breeding for 20+ years**
- **Both plant breeding programs have similar orientation (classical plant breeding + use of modern biotechnologies)**

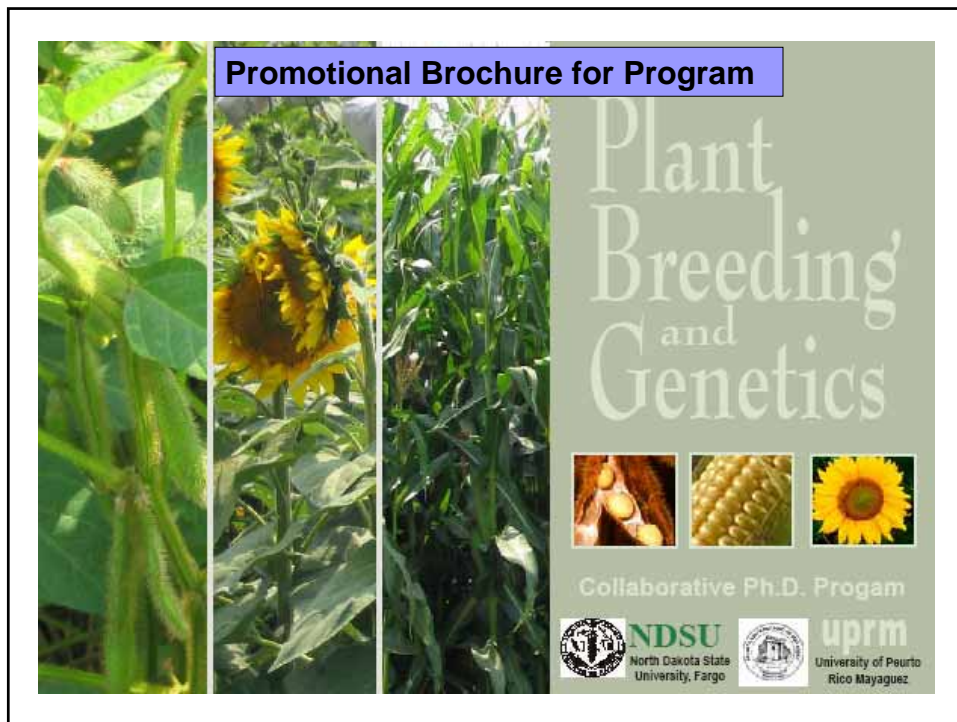
...Background

- There is a very high demand for plant breeders at both the M.S. and Ph.D. level, both in Puerto Rico and across the U.S.
- Puerto Rico is one of two important locations in the U.S. for winter nursery activities
- All major seed companies and many public programs have winter nursery activities in Puerto Rico

...Background

- **September 2005 - Agreement signed between UPR and NDSU establishing collaborative Ph.D. program in Plant Breeding and Genetics**
- **Degree to be conferred by NDSU; Students do research and take up to 12 credits at UPR**





Objective of Collaborative Program:

- Promote interest in, and development of, careers in plant breeding and genetics among Puerto Rican students

This goal is compatible with those of the HSI Educational Grant Program. Therefore, we looked to this program as a source of funding to begin what we hope will be a long-term collaboration between UPRM and NDSU, as well as a model for other institutions

HSI Project Objectives

- Provide opportunities for undergrads to participate in plant breeding research at both UPRM and NDSU (summer internships)
- Support graduate students studying plant breeding at M.S. and Ph.D. level; Provide summer internships at NDSU for M.S. students to expose them to NDSU Ph.D. program
- Upgrade plant breeding and molecular marker laboratories at Mayagüez (equipment)
- Develop new plant breeding courses; Update and promote undergraduate plant breeding course; Develop collaborative UPRM-NDSU courses
- Provide opportunities for professional improvement to UPR faculty with M.S. degrees

Other Collaborators

- **U.S.D.A.-A.R.S. Tropical Agricultural Research Station, Mayagüez**
- **Monsanto**
- **Syngenta Seeds, Inc.**
- **Mycogen Seeds, Inc.**

CSREES Strategic Goals Addressed:

- **GOAL 1: ENHANCE ECONOMIC OPPORTUNITIES FOR AGRICULTURAL PRODUCERS**

Plant breeding plays a pivotal role in providing the U.S. with products (new varieties) that promote efficiency of production systems, lower costs for farmers and consumers, and improve market competitiveness

CSREES Strategic Goals Addressed:

- **GOAL 3: ENHANCE PROTECTION AND SAFETY OF THE NATION'S AGRICULTURE AND FOOD SUPPLY**

Breeding for genetic resistance produces crops with reduced incidence of pest and diseases while minimizing the use of costly and environmentally unsound chemical approaches to control

CSREES Strategic Goals Addressed:

- **GOAL 4: IMPROVE THE NATION'S NUTRITION AND HEALTH**

Plant breeders provide the consumer with a greater variety of more attractive fruits and vegetables, improve the nutritional quality of our foods, thus making it easier to follow a healthier lifestyle

CSREES Strategic Goals Addressed:

- **GOAL 5: PROTECT AND ENHANCE THE NATION'S NATURAL RESOURCE BASE AND ENVIRONMENT**

Plant breeders work with forest, rangeland and ornamental plant species. Forest species can be improved for paper and lumber production, rangeland species can provide better erosion control, and ornamentals can be improved to better enhance our urban environments

Activities

- Visits to high schools (6/year); mentor science fair projects in plant breeding and genetics
- “Plant Breeding Career Days” (visits to seed companies on Island) (25 students/year)
- Undergraduate research projects (3/yr) (at least 1/year with USDA breeders)
- NDSU summer internships (2 to 5 / year)

...Activities

- Presentation of research results at national professional meetings (3 undergrad and/or grad students per year)
- M.S. and Ph.D. student training (at least 1 student at each level)
- Revision of current undergrad course and development of 5 new grad courses

...Activities

- Purchase equipment for plant breeding and molecular marker laboratories
- Annual short courses for faculty at M.S. level who are involved with germplasm evaluation (10 faculty)
- Develop and maintain a web site that features all our activities and serves to promote our collaborative efforts

Evaluation

- Baseline data will be collected and documented by PDs at beginning of project
- Formative evaluation will take place at the beginning of the 2nd year to ascertain progress to date and identify problems
- Summative evaluation at end of 3rd year
- Both evaluations will be carried out by educators in the area of plant breeding and genetics
- Successes will be assessed on both quantitative and qualitative evidence
- Goals, stakeholders, evaluation questions, data sources and collections methods have been defined

Expected Impact

- Increase enrollment in basic plant breeding by 50% (12/year to 18/year)
- Provide more and better qualified B.S. graduates to the local seed industry
- Increase number of M.S. students in plant breeding by 25%
- Have at least 1 Puerto Rican student enrolled in the NDSU PhD program

Expected Impact

- New course offerings and laboratory facilities will make the UPRM plant breeding program more competitive with other programs
- Better trained faculty